

CLAIMS

1. A steel plate for enameling, having improved formability, anti-aging property, and enameling properties, comprising by mass

carbon: not more than 0.0018%,

silicon: not more than 0.020%,

manganese: 0.10 to 0.30%,

phosphorus: 0.010 to 0.035%,

sulfur: not more than 0.035%,

aluminum: not more than 0.010%,

nitrogen: 0.0008 to 0.0050%,

boron: not more than 0.0050% and not less than 0.6 time the nitrogen content, and

oxygen: 0.005 to 0.050%,

(nitrogen present as BN)/(nitrogen present as AlN) being not less than 10.0,

with the balance consisting of iron and unavoidable impurities.

2. A steel plate for enameling, having improved formability, anti-aging property, and enameling properties, comprising by mass

carbon: not more than 0.0018%,

silicon: not more than 0.020%,

manganese: 0.10 to 0.30%,

phosphorus: 0.010 to 0.035%,

sulfur: not more than 0.035%,

aluminum: not more than 0.010%,

nitrogen: 0.0008 to 0.0050%,

boron: not more than 0.0050% and not less than 0.6 time the nitrogen content, and

oxygen: 0.005 to 0.050%,

(nitrogen present as BN)/(nitrogen content) being not less than 0.80,

with the balance consisting of iron and unavoidable impurities.

3. A steel plate for enameling, having improved

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formability, anti-aging property, and enameling properties, comprising by mass

carbon: not more than 0.0018%,

silicon: not more than 0.020%,

manganese: 0.10 to 0.30%,

phosphorus: 0.010 to 0.035%,

sulfur: not more than 0.035%,

aluminum: not more than 0.010%,

nitrogen: 0.0008 to 0.0050%,

boron: not more than 0.0050% and not less than 0.6 time the nitrogen content, and

oxygen: 0.005 to 0.050%,

the average diameter of precipitates of BN alone or BN-containing composite precipitates having a diameter of not less than 0.005 μm and not more than 0.50 μm being not less than 0.010 μm , not more than 10% of the number of precipitates of BN alone or BN-containing composite precipitates having a diameter of not less than 0.005 μm and not more than 0.50 μm being accounted for by precipitates having a diameter of not more than 0.010 μm ,

with the balance consisting of iron and unavoidable impurities.

4. A process for producing a hot rolled steel plate for enameling, having improved formability, anti-aging property, and enameling properties, comprising the steps of:

hot rolling a cast slab comprising by mass

carbon: not more than 0.0018%,

silicon: not more than 0.020%,

manganese: 0.10 to 0.30%,

phosphorus: 0.010 to 0.035%,

sulfur: not more than 0.035%,

aluminum: not more than 0.010%,

nitrogen: 0.0008 to 0.0050%,

boron: not more than 0.0050% and not less than 0.6 time the nitrogen content, and

oxygen: 0.005 to 0.050%; and

then subjecting the hot strip to skin pass rolling with a reduction of not more than 5%.

5. A process for producing a cold rolled steel plate for enameling, having improved formability, anti-aging property, and enameling properties, comprising the steps of:

hot rolling a cast slab comprising by mass

carbon: not more than 0.0018%,

silicon: not more than 0.020%,

manganese: 0.10 to 0.30%,

phosphorus: 0.010 to 0.035%,

sulfur: not more than 0.035%,

aluminum: not more than 0.010%,

nitrogen: 0.0008 to 0.0050%,

boron: not more than 0.0050% and not less than 0.6 time the nitrogen content, and

oxygen: 0.005 to 0.050%;

cold rolling the hot strip with a cold rolling reduction of not less than 60%;

after the cold rolling, annealing the cold strip at or above the recrystallization temperature; and

subjecting the annealed strip to skin pass rolling with a reduction of not more than 5%.

6. The process for producing a steel plate for enameling, having improved formability, anti-aging property, and enameling properties according to claim 4 or 5, wherein the cast slab is hot rolled at a slab heating temperature of 1000 to 1150°C.

7. The process for producing a steel plate for enameling, having improved formability, anti-aging property, and enameling properties according to any one of claims 4 to 6, wherein the cast slab is hot rolled, and is coiled at 650 to 750°C.